IFW

Attorney Docket No. 54008.8033.US00
P03-0004

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: ERIC J. BERGMAN	EXAMINER:
APPLICATION NO.: 10/631,376	ART UNIT: 1746
FILED: JULY 30, 2003	CONF. NO: 2135
FOR: METHODS OF THINNING A SILICON WAFER USING HF AND OZONE	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

1. Timing of Submission

This supplemental IDS is believed to be timely in that it is being submitted under 37 CFR § 1.97(b), that is (1) within three months of the filing date of the application, which is not a continued prosecution application filed under § 1.53(d); or (2) within three months of entry of the national stage as set forth in 37 CFR § 1.491; or (3) before the mailing of a first Office action on the merits; or (4) before the mailing of a first Office action after filing a request for continued examination under § 1.114. Thus, no fee is required. The references listed on the enclosed Form PTO-1449 (modified) may be material to the examination of this application; the Examiner is requested to make them of record in the application.

2. Cited References

Copies of all foreign and non-patent references are enclosed. Copies of the U.S. references are not provided, given that this application was filed after July 1, 2003.

Certificate of Mailing

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

July 2, 2004
Date of Deposit

Debbie Gilbert
Debbie Gilbert

[54008-8033/LA041610.015]

3. Effect of Information Disclosure Statement (37 C.F.R. § 1.97(h))

This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

4. Fee Payment

No fees are believed due because this Information Disclosure Statement is being filed before the mailing of a first Office Action.

Dated: June 23, 2004

Respectfully submitted,

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Kenneth H. Ohriner
Reg. No. 31,646

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Form PTO-1449 (Modified)

(Use several sheets if necessary)

Sheet	1	of	5

COMPLETE IF KNOWN	
Application Number	10/631,376
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	U.S. Patent or Application NUMBER	Kind Code (if known)	Name of Patentee or Inventor of Cited Document	Date of Publication or Filing Date of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	AB	4,695,327		Grebinski	09/22/87	
	AC	4,974,530		Lyon	12/04/90	
	AD	5,055,138		Slinn	10/08/91	
	AE	5,120,370		Mori et al.	06/09/92	
	AF	5,181,985		Lampert et al.	01/26/93	
	AG	5,232,511		Bergman	08/03/93	
	AH	5,234,540		Grant et al.	08/10/93	
	AI	5,235,995		Bergman et al.	08/17/93	
	AJ	5,244,000		Stanford et al.	09/14/93	
	AK	5,248,380		Tanaka	09/28/93	
	AL	5,308,745		Schwartzkopf	05/03/94	
	AM	5,378,317		Kashiwase et al.	01/03/95	
	AN	5,415,191		Mashimo et al.	05/16/95	
	AO	5,464,480		Matthews	11/07/95	
	AP	5,503,708		Koizumi et al.	04/02/96	
	AQ	5,520,744		Fujikawa et al.	05/28/96	
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	AS	5,647,386		Kaiser	07/15/97	
	AT	5,658,615		Hasebe et al.	08/19/97	
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	AV	5,714,203		Schellenberger et al.	02/03/98	
	AW	5,749,975		Li et al.	05/12/98	
	AX	5,776,296		Matthews	07/07/98	
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	AZ	5,858,107		Chao et al.	01/12/99	
	BA	5,896,875		Yoneda	04/27/99	
	BB	5,911,837		Matthews	06/15/99	

EXAMINER	DATE CONSIDERED

*EXAMINER: Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).

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OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS			
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	CF	Huynh, C., *et al.*, "Plasma versus ozone photoresist ashing: Temperature effects on process-induced mobile ion contamination." *J. Vac. Sci. Technol.*, B9(2):353-356 (Mar./Apr. 1991).	
	CG	Isagawa, T., *et al.*, "Ultra Clean Surface Preparation Using Ozonized Ultrapure Water." *Extended Abstracts of the 1992 Int'l. Conf. on Solid State Devices and Materials*, pp. 193-195 (1992).	
	CH	Kasi, S., *et al.*, "Surface Hydrocarbon Removal from Si by UV/Ozone." *ECS Extended Abstracts*, No. 458, pp. 691-692 (1990).	
	CI	Kasi, S., *et al.*, "Vapor phase hydrocarbon removal for Si processing." *Appl. Phys. Lett.*, 57(20):2095-2097 (Nov. 1990).	
	CJ	Kern, W., "The Evolution of Silicon Wafer Cleaning Technology." *J. Electrochem. Soc.*, 137(6):1887-1892 (Jun. 1990).	
	CK	Krusell, W.C., *et al.*, "Cleaning Technologies for High Volume Production of Silicon Wafers." *ECS Proc. of the First Int'l. Symposium on Cleaning Technology in Semiconductor Device Mfg.*, pp. 23-32 (Oct. 1989).	
	CL	Krusell, W.C., *et al.*, "The Characterization of Silicon Substrate Cleaning Treatments by use of SIMS and MOS Electrical Testing." *ECS Extended Abstracts*, No. 229, p. 331-332 (1986).	
	CM	Nelson, S., "Ozonated water for photoresist removal." *Solid State Technology*, p. 107-112 (Jul. 1999).	
	CN	Ohmi, T., *et al.*, "Native Oxide Growth and Organic Impurity Removal on Si Surface with Ozone-Injected Ultrapure Water." *J. Electrochem. Soc.*, 140(3):804-810 (Mar. 1993).	
	CO	Sehested, K., *et al.*, "Decomposition of Ozone in Aqueous Acetic Acid Solutions (pH 0-4)." *J. Phys. Chem.*, pp. 1005-1009 (1992).	
	CP	Shimada, H., *et al.*, "Residual-Surfactant-Free Photoresist Development Process." *J. Electrochem., Soc.*, 139(6):1721-1730 (Jun. 1992).	

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	CQ	Suemitsu, M., *et al.*, "Low Temperature Silicon Surface Cleaning by HF Etching/Ultraviolet Ozone Cleaning (HF/UVOC) Method (I)-Optimization of the HF Treatment." *Japanese Journal of Applied Physics*, 28(12):2421-2424 (Dec. 1989).	
	CR	Tabe, M., "UV ozone cleaning of silicon substrates in silicon molecular beam epitaxy." *Appl. Phys. Lett.*, 45(10):1073-1075 (Nov. 1984).	
	CS	Tong, J., *et al.*, "Aqueous Ozone Cleaning of Silicon Wafers." *ECS Extended Abstracts*, Phoenix, AZ, Abstract No. 506, pp. 753 (Oct. 13-17, 1991).	
	CT	Tong, J., *et al.*, "Aqueous Ozone Cleaning of Silicon Wafers." *Proc. of 2.sup.nd Int'l. Symposium on Cleaning Tech. In Semiconductor Device Mfg.*, pp. 18-25 (Oct. 1992).	
	CU	Vig, J., "UV/Ozone Cleaning of Surfaces." *U.S. Army Elec. Tech. and Devices Lab.*, pp. 1-26.	
	CV	Vig, J., "UV/Ozone Cleaning of Surfaces: A Review." *Surface Contamination: Genesis, Detection, and Control*, pp. 235-253 (1979).	
	CW	Vig, J., *et al.*, "UV/Ozone Cleaning of Surfaces." *IEEE Transactions on Parts, Hybrids, and Packaging*, Vol. PHP-12(4):365-370 (Dec. 1976).	
	CX	Vig, J., "UV/Ozone Cleaning of Surfaces." *U.S. Army Electronics Technology and Devices Laboratory*, ERADCOM, Ft. Monmouth, NJ, 07703-5302, pp. 1027-1034 (Sep./Oct. 1984).	
	CY	Zafonte, L., *et al.*, "UV/Ozone Cleaning For Organics Removal on Silicon Wafers." *SPIE Optical Microlithography III: Technology for the Next Decade*, 470:164-175 (1984).	
	CZ	Zazzera, L.A., *et al.*, "XPS and SIMS Study of Anhydrous HF and UV/Ozone-Modified Silicon (100) Surfaces." *J. Electrochem. Soc.*, 136(2):484-491 (Feb. 1989).	
	DA	"Ozone Concentration Measurement in a Process Gas." *Proposed IOA Pan American Group Guideline*, pp. 1-21 (Dec. 1993).	
	DB	"Ozone for Semiconductor Applications." *Sorbios*, pp. 1-6 (Oct. 1991).	

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	BC	5,944,907		Ohmi	08/31/99	
	BD	5,971,368		Nelson et al.	10/26/99	
	BE	6,299,696		Kamikawa et al.	10/09/01	
	BF	2002/0011257		DeGendt	01/31/02	
	BG	6,551,409		DeGendt	04/22/03	

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Examiner Initials*	Cite No.	Foreign Patent or Application Office	NUMBER	Kind Code (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication or Filing Date of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
	BH	EP	0 344 764		Wacker Chemitronic	1989-12-06		
	BI	EP	0 548 596		Chlorine Engineers Corp.	30.06.93		x
	BJ	EP	0 702 399		Siemens AG	1996-03-20		
	BK	GB	2 287 827		NEC Corporation	27.09.1995		x
	BL	JP	52-12063		Hitachi Ltd.	04.04.1977		x
	BM	JP	03-041729		Tokyo Electron Ltd.	22.02.1991		
	BN	JP	64-008630		Tokyo Electron Ltd.	12.01.1989		
	BO	JP	1189921		Mitsubishi Electric Corp.	1989-07-31		
	BP	JP	54-034751		Hitachi Ltd.	14.03.1979		
	BQ	JP	04-079221		Seiko Epson Corp.	12.03.1992		
	BR	JP	61-004232		NEC Corp.	10.01.1986		

OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS

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	BS	Alder, M., *et al.*, "The Kinetics and Mechanism of Hydroxide Ion Catalyzed Ozone Decomposition in Aqueous Solution." *J. Am. Chem. Soc.*, 72:1884-1886 (1950).	
	BT	Amick, J.A., "Cleanliness and the Cleaning of Silicon Wafers." *Solid State Technology*, pp. 47-52 (Nov. 1976).	

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	BU	Anantharaman, *et al.*, "ORGANICS: Detection and Characterization of Organics in Semiconductor DI Water Processes." *Ultrapure Water*, pp. 30-36 (Apr. 1994).	
	BV	Baumgärtner, H., *et al.*, "Ozone Cleaning of the Si-SiO_2 System." *Appl. Phys. A*, 43:223-226 (1987).	
	BW	Bedge, S., *et al.*, "Kinetics of UV/O_2 Cleaning and Surface Passivation: Experiments and Modeling." *Mat. Res. Soc. Symp. Proc.*, 259:207-212 (1992).	
	BX	Bolon, D.A., *et al.*, "Ultraviolet Depolymerization of Photoresist Polymers," *Polymer Engineering and Science*, 12(2):108-111 (1972).	
	BY	Christenson, K., *et al.*, "Deionized Water Helps Remove Wafer Stripping 'Resist'-ance." www.precisioncleaningweb.com--*Precision Cleaning Web--Archives*, pp. 10-20 (Apr. 1998).	
	BZ	Egitto, F.D., *et al.*, "Removal of Poly (Dimethylsiloxane) Contamination From Silicon Surfaces With UV/Ozone Treatment." *Mat. Res. Soc. Symp. Proc.*, 385:245-250 (1995).	
	CA	Gabriel, C., *et al.*, "Reduced Device Damage Using An Ozone Based Photoresist Removal Process." *SPIE Advances in Resist Technology and Processing VI*, 1086:598-604 (1989).	
	CB	Ganesan, G., *et al.*, "Characterizing Organic Contamination in IC Package Assembly." *The Int'l. Soc. for Hybrid Microelectronics*, 17(2), Second Quarter, 152-160 (1994).	
	CC	Golland, D.E., *et al.*, "The Clean Module: Advanced Technology for Processing Silicon Wafers." *Semiconductor Int'l.*, pp. 154-157 (Sep. 1987).	
	CD	Goulding, M.R., "The selective epitaxial growth of silicon," *Materials Science and Engineering,* Vol. B17, pp. 47-67 (1993).	
	CE	Heyns, M.M., *et al.*, "New Wet Cleaning Strategies for Obtaining Highly Reliable Thin Oxides." *MRP Symposium Proceedings on Materials Research Society*, Spring Meeting, San Francisco, CA, Apr. 12-13, p. 35 (1993).	

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